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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/003,216

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03/24/2005

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EXAMINER

CURTIS, CRAIG

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/003,216

Applicant(s)

TAKAHARA ET AL.

Examiner

Craig Curtis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 19-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Disposition of the Instant Application

- This Office Action is responsive to Applicants' Amendment filed on 27 December 2004, which has been made of record in the file.
- By this amendment, Applicants have cancelled claims 16-18; amended independent claims 1, 6, and 10; and newly added claims 19-21.
- Accordingly, claims 1-15 & 19-21 are presently pending in the instant application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 1-4, 6-8, 10-14, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. (US 6,341,038 B1) in view of Wentz (US 4,515,441 A) and Fukushima et al. (JP362200320A).**

Budd et al. disclose (see Figs. 3A & 4A) the invention as claimed--[a] polarization conversion element/optical system for converting light having a nonuniform plane of polarization to light having a uniform plane of polarization, comprising:

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polarizer means (viz., 302: see col. 4, ll. 53-67—col. 5, ll. 1-17) having a different incidence angle dependency relative to a first polarized light component and a second polarized light component which have mutually intersecting planes of polarization (inherent), wherein the dielectric multilayer film is configured to transmit light of the first polarized light component at a first incidence angle, reflect light of the second polarized light component at the first incidence angle, and transmit light of the second polarized light component at a first incidence angle, and transmit (however negligibly) the second polarized light component at a second incidence angle different from the first incidence angle (please see especially col. 4, ll. 57-58, the limitations regarding the respective angles being implicitly met in light of the definitional nature of S & P light, as well as in view of Snell's Law and the conventions associated with Fresnel reflection and transmission coefficients of mutually orthogonal light components incident upon a material boundary) ;

a reflecting element (402 in Fig. 4A) configured such that light entering the polarizer means at a first incidence angle and transmitted through the polarizer means is reflected from the reflecting element (see in particular 402 in Fig. 4A) so as to impinge the polarizer means at an angle equal in magnitude to said second incidence angle (see Fig. 4A, in light of Fig. 3A's depiction of polarizer means 302);

a quarter-wavelength plate (viz., 114) positioned: *medially to* said polarizer means (302) and said reflecting element (as recited in independent claim 1: See Fig. 3), and *between* said polarizer means and said reflecting element (as recited in claim 6), wherein, for incident light impinging on the polarizer means at the first incidence angle and comprising light having a first

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polarization direction and light having a second polarization direction: light of the first polarization direction incident on the polarizer means at the first incidence angle is transmitted through the polarizing means, light of the second polarization direction incident on the polarizing means at the first incidence angle is reflected from the polarizing means (please see col. 4, ll. 57-58), the transmitted light of the first polarization direction is reflected at the reflecting element and is converted to light having the second polarization direction by passing through the quarter-wavelength plate twice (see Fig. 4A), and the converted light having the second polarization direction is transmitted through the polarizing means at the second incidence angle (see Fig. 3A in light of Fig. 4A), such that the reflected light of the second polarization direction and the converted light having the second polarization direction emerge from a same side of polarizing means (read: the polarizing means), including, incidentally, wherein the difference between said first incidence angle and said second incidence angle is 30^0 or less (see Figs. 3A & 4A)--**EXCEPT FOR** explicit teachings wherein said polarizing means is a dielectric multilayer film & wherein said reflecting element is a reflecting-type diffraction element.

However, **Wentz** expressly discloses polarizing means comprising a dielectric multilayer film (viz., see dielectric layers 22a, 24a, 26a (as well as 22b, 24b, 26b) in Fig. 2), and **Fukushima et al.** expressly disclose the use of a diffraction element (viz., diffraction grating 11 in Fig. 1) as reflecting-type diffraction element in lieu of the disclosed flat mirror 402. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the polarization conversion element/optical system taught by **Budd et al.** such that (1) its polarizing means (i.e., 302) comprise a dielectric multilayer film, as expressly taught

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by **Wentz**, for at least the purpose of ensuring a very high-degree of polarization separation, and that (2) the flat mirror 402 of the polarization conversion element/optical system taught by **Budd et al.** be replaced by a reflecting-type diffraction element, such as 11 taught by **Fukushima et al.**, for at least the purpose of making use of a highly efficient, art-recognized equivalent reflecting element.

With particular reference to claim 3, the combination additionally discloses a dielectric multilayer optical polarizer (18) exhibits an efficiency of transmission of transmitted light is greater than about 95%, with the efficiency of reflection for the oppositely or orthogonally polarized light also being greater than about 95% (see col. 2, ll. 20-25).

With particular reference to the recitations in claims 6, 7, 12, & 13, the polarization conversion element/optical system disclosed by the combination and depicted (sans quarter-waveplate) in Fig. 1 of **Fukushima et al.** can be read as meeting both wherein said dielectric multilayer film, quarter-wavelength plate, and diffraction element are *integral* with another (i.e., as depicted w/r/t 10 in Fig. 1 of **Fukushima et al.**), wherein a substrate is disposed between said dielectric multilayer film and said diffraction element (see 14, *id.*), and wherein said diffraction grating is formed in an element that is distinct from said quarter-wavelength plate (cf. elements 11 & 16, *id.*), it having been held that forming in one piece an article which has formerly been formed in pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

With regard to claim 8, please see uppermost left-hand portion of Fig. 1 in **Fukushima et al.**--that is, where said reflective diffraction element (11) and waveplate (16) abut.

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With regard to claim 14, please see planar mirror 402 in **Budd et al.**

With regard to claims 19-21, please note that said dielectric multilayer film and said quarter-wavelength plate of a taught by the combination (the positions of said dielectric multilayer film and said quarter-wavelength plate being depicted in Fig. 3A of **Budd et al.**: that is, elements 302 and 114 are disposed parallel to one another).

2. **Claims 5, 9, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. (US 6,341,038 B1) in view of Wentz (US 4,515,441 A) and Fukushima et al. (JP362200320A), as applied above to, inter alia, claims 1, 6, and 10, and further in view of Steiner et al. (EP 0471109 A1).**

The combination discloses the invention as set forth above **EXCEPT FOR** an explicit teaching wherein the said dielectric multilayer film comprises alternating layers of a first material containing SiO_2 and a second material containing TiO_2 and La_2O_3 .

Steiner et al., however, disclose a layer (8 in Fig. 3B) containing various combinations of the oxides SiO_2 , La_2O_3 , and TiO_2 . It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the invention of the combination such that its dielectric multilayer film comprise alternating layers of a first material containing SiO_2 and a second material containing TiO_2 and La_2O_3 , as suggested by **Steiner et al.**, for at least the purpose of achieving a desired transmittance/reflectance performance from said dielectric multilayer film.

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Response to Arguments

3. Applicants' arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection set forth hereinbefore.

Contact Information

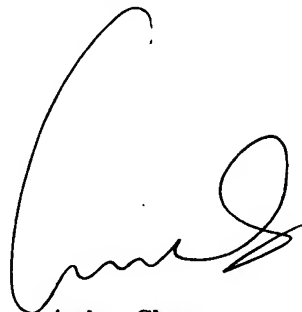
4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis, whose telephone number is (571) 272-2311. The examiner can normally be reached on Monday-Friday, 9:00 A.M. to 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn, can be reached at (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Craig H. Curtis
Group Art Unit
17 March 2005



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Technology Center 2800